QUALITY ASSURANCE PROJECT PLAN FOR MONITORING WELL INSTALLATION AND SAMPLING ACTIVITIES

at the

ATLANTIC GROUNDWATER SITE
ATLANTIC, IOWA

Superfund Technical Assessment and Response Team (START) Contract
Contract No. 68-S7-01-41, Task Order 0008.17

Prepared For:

U.S. Environmental Protection Agency
Region 7
Superfund Division
901 North 5th Street
Kansas City, Kansas 66101

August 16, 2002

Prepared By:

Tetra Tech EM Inc.
8030 Flint Street
Lenexa, Kansas 66214

CONTENTS

Region 7 Superfund Program
Quality Assurance Project Plan Form
for the Atlantic Groundwater Site

Project Information:

Site Name: Atlantic Groundwater Site		**City:** Atlantic	**State:** IA
EPA Project Manager: James MacDonald		**Tetra Tech START Project Manager:** Steve Holmes	
Approved By: [signature] **Title:** EPA Project Manager	**Date:** 9/5/02	**Prepared For:** EPA Region 7 Superfund Division	
Approved By: [signature] **Title:** EPA Superfund QA Coordinator	**Date:** 9/5/02	**Prepared By:** Steve Holmes **Date:** 08/16/02	
Approved By: [signature] **Title:** START Project Manager	**Date:** 9/3/02	**Tetra Tech START Project Number:** G9011.01.0008.17	
Approved By: [signature] **Title:** START Program Manager	**Date:** 9/3/02		
Approved By: [signature] **Title:** START QA Manager	**Date:** 9/4/02		

1.0 Project Management:

1.1 Distribution List

EPA—Region 7: James MacDonald, EPA Project Manager
Bob Dona, Superfund QA Coordinator
Roy Crossland, EPA Project Officer

Tetra Tech START: Steve Holmes, Project Manager

1.2 Project/Task Organization

James MacDonald, of the EPA Region 7 Superfund Division, will serve as the EPA project manager for the activities described in this QAPP. Steve Holmes will serve as the Tetra Tech START project manager.

1.3 Problem Definition/Background:

Description: This site-specific Quality Assurance Project Plan form is prepared as an addendum to the **Generic Quality Assurance Project Plan for Superfund Integrated Assessment Activities,** November 1998, and contains site-specific data quality objectives for the sampling activities described herein.

■ Description attached.

☐ Description in referenced report: _____ _____
Title **Date**

1.4 Project/Task Description:

☐ CERCLA PA ☐ CERCLA SI ☐ Brownfields Assessment
■ Other (description attached): ☐ Pre-CERCLIS Site Screening ■ Removal Assessment

Other Description: Groundwater monitoring associated with the installation of three monitoring wells. Construction specifications for these wells are detailed in a separate Statement of Work prepared by Tetra Tech START.

Schedule: Field work is scheduled for September 2002.

1.5 Quality Objectives and Criteria for Measurement Data:

a. Accuracy: ■ Identified in attached table.
b. Precision: ■ Identified in attached table.
c. Reproducibility: ■ Identified in attached table.
d. Completeness*: ■ Identified in attached table.
e. Comparability: ■ Identified in attached table.

*A completeness goal of 90 percent has been established for this project. However, if the completeness goal is not met, EPA may still be able to make site decisions based on any or all of the remaining validated data.

1.6 Special Training/Certification Requirements:

■ OSHA 1910 ■ Special Equipment/Instrument Operator (describe below): ☐ Other (describe below):

For operation of a Geoprobe direct push sampling apparatus, a trained and experienced operator will be required.

1.7 Documentation and Records:

■ Field Sheets ■ Site Log ■ Trip Report ■ Site Maps ☐ Video
■ Chain of Custody ■ Health and Safety Plan ■ Letter Report ■ Photos

■ Sample documentation will follow EPA Region 7 SOP 2420.5C

■ Other: Analytical information will be handled according to procedures identified in Table 2.

2.0 Measurement and Data Acquisition:

2.1 Sampling Process Design:

☐ Random Sampling ☐ Transect Sampling ■ Biased/Judgmental Sampling ☐ Stratified Random Sampling
☐ Search Sampling ☐ Systematic Grid ☐ Systematic Random Sampling ☐ Definitive Sampling
☐ Screening w/o Definitive Confirmation ☐ Screening w/ Definitive Confirmation ☐ Sample Map Attached

☐ Other (Provide rationale behind each sample):

The proposed sampling scheme will be judgmental, in accordance with the Guidance for Performing Site Inspections Under CERCLA, OSWER Directive #9345.1-05, September 1992, and "Removal Program Representative Sampling Guidance, Volume 1: Soil, OSWER Directive 9360.4-10, November 1991. Judgmental sampling is the subjective (biased) selection of sampling locations based on historical information, visual inspection, and the best professional judgement of the sampler(s). See Appendices 1 and 2 for additional site-specific information and site location maps.

Three two-inch-diameter groundwater monitoring wells will be installed within the tetrachloroethene (PCE) plume identified by a 1987 soil gas survey conducted by Ecology and Environment, Incorporated. Two wells will be installed at the suspected source area, and the third well will be installed in an anticipated downgradient direction of the source area. Two soil samples and one groundwater sample will be collected from each monitoring well location for off-site analysis of VOCs. Additionally, 12 locations will be selected in a general grid pattern covering the suspected source area, where a Geoprobe sampling apparatus will be advanced to a depth of 35 feet or refusal which ever occurs first. Two soil samples will be selected from each of these Geoprobe boring locations for off-site analysis of VOCs. A photoionizaiton detector will be used as an aid in selecting the two soil sampling intervals from each monitoring well and Geoprobe location for off site analysis of VOCs. In general, the sample intervals will be selected based on the highest PID readings at each location. If no elevated PID readings are observed at a sampling location, best professional judgement will be used to select two representative sampling intervals for off-site analysis. All samples will be delivered to the Region 7 EPA Laboratory in Kansas City, Kansas.

Sampling Event Summary	Matrix	No. of Samples*	Field Parameters	Off-Site Analysis
Monitoring wells	Water	3	temperature, conductivity, turbidity, and pH	VOCs
Monitoring well borings	Soil	6	photoionization detector (VOCs)	VOCs
Geoprobe borings	Soil	24	photoionization detector (VOCs)	VOCs

*NOTE: QC samples are not included with these totals. See Table 1 for a complete sample summary.

2.2 Sample Methods Requirements:

Matrix	Sampling Method	EPA SOP(s)/Methods
Water	Disposable polyethylene bailers (monitoring wells)	4230.15A
Soil	Geoprobe/drill rig with mini-cores collected from soil cores	4230.7A & Method 5035

☐ Other Description:

2.3 Sample Handling and Custody Requirements:

■ Samples will be collected in accordance with procedures defined in Region 7 EPA SOP 2420.6C.
■ COC will be maintained as directed by Region 7 EPA SOP 2420.4B.
■ Samples will be accepted according to Region 7 EPA SOP 2420.1C.
☐ Other (Describe):

2.4 Analytical Methods Requirements: ■ Identified in attached table.

■ Rationale: The requested analyses have been selected based on the historical information on the site and program experience with similar types of sites.
☐ Other (Describe):

2.5 Quality Control Requirements: ☐ Not Applicable ■ Identified in attached table.

■ Field QC Samples: For this investigation, field QC samples will consist of trip blanks, field blanks, and duplicate samples. One trip blank (water) will be prepared per sampling event. The trip blank will be prepared by Region 7 EPA Laboratory personnel. The trip blank willbe used to determine whether any VOCs were introduced during transportation of the samples/containers. One field blank will also be prepared by the START sampling team using high-purity water supplied by the Region 7 EPA Laboratory. The field blank will be used to assess contamination of sample containers and preservatives used for the project. One duplicate groundwater sample will be collected from one monitoring well to be installed during this activity, along with one duplicate soil sample from a soil boring at one of the monitoring well locations. Also, two duplicate soil samples will be collected from locations where sampling is conducted with the Geoprobe. The duplicate samples will be collected to assess total method precision. All QC samples will be submitted for the analyses listed in the attached tables. Criteria for evaluation of blank samples are dependent on the levels of contamination found in environmental samples to determine whether the environmental samples are representative. Duplicate results will be evaluated based on criteria established for the associated analytical methods to determine the overall precision of the sampling data. Analytical results of all QC samples will be evaluated by the EPA project manager and EPA contractor(s) to determine the usability of the data.
☐ Other (Describe):

2.6 Instrument/Equipment Testing, Inspection, and Maintenance Requirements: ☐ Not Applicable

■ Testing, inspection, and maintenance of analytical instrumentation will be performed in accordance with the previously referenced SOPs and/or manufacturers' recommendations.
■ Other (Describe): Testing, inspection, and maintenance of field instruments (water quality meter, PID, etc.) will be performed in accordance with the manufacturers' recommendations.

2.7 Instrument Calibration and Frequency: ☐ Not Applicable

■ Calibration of laboratory equipment will be performed as described in the previously referenced SOPs and/or manufacturers' recommendations.
■ Other (Describe): Calibration of field instruments (water quality meter, PID, etc.) will be performed daily, as described in the manufacturers' recommendations.

2.8 Inspection/Acceptance Requirements for Supplies and Consumables: ☐ Not Applicable

■ All sample containers will meet EPA criteria for cleaning procedures for low-level chemical analysis. Sample containers will have Level II certifications provided by the manufacturer in accordance with pre-cleaning criteria established by EPA in *Specifications and Guidelines for Obtaining Contaminant-Free Containers*.
☐ Other (Describe):

2.9 Data Acquisition Requirements: ☐ Not Applicable

■ Previous data/information pertaining to the site (including other analytical data, reports, photos, maps, etc., which are referenced in this QAPP) have been compiled by EPA and/or its contractor(s) from other sources. Some of that data has not been verified by EPA and/or its contractor(s); however, the information will not be used for decision-making purposes by EPA without verification by an independent professional qualified to verify such data/information.

☐ Other (Describe):

2.10 Data Management:

■ All laboratory data acquired will be managed in accordance with Region 7 EPA SOP 2410.1C.

☐ Other (Describe):

3.0 Assessment and Oversight:

3.1 Assessment and Response Actions:

☐ Peer Review ☐ Management Review ☐ Field Audit ☐ Lab Audit

■ Assessment and response actions pertaining to analytical phases of the project are addressed in Region 7 EPA SOPs 2430.5A and 2430.12D.

☐ Other (Describe):

3.1A Corrective Action:

■ Corrective actions will be taken at the discretion of the EPA project manager, whenever there appear to be problems that could adversely affect data quality and/or resulting decisions affecting future response actions pertaining to the site.

☐ Other (Describe):

3.2 Reports to Management:

☐ Audit Report ☐ Data Validation Report ☐ Project Status Report ☐ None Required

■ A letter report describing the sampling techniques, locations, problems encountered (with resolutions to those problems), and interpretation of analytical results will be submitted to the EPA.

☐ Other (Describe):

4.0 Data Validation and Usability:

4.1 Data Review, Validation, and Verification Requirements: ☐ Identified in attached table.

■ Data review and verification will be performed by a qualified analyst and the laboratory's section manager as described in Region 7 EPA SOPs 2430.5A and 2430.12D.

☐ Other (Describe):

4.2 Validation and Verification Methods: ☐ Identified in attached table.

■ The data will be validated in accordance with Region 7 EPA SOPs 2430.5A and 2430.12D.

■ The EPA site manager will inspect the data to provide a final review. The EPA site manager will review the data, if applicable for laboratory spikes and duplicates, laboratory blanks, and the trip blank to ensure that they are acceptable. The EPA site manager will also compare the sample descriptions with the field sheets for consistency and will ensure that any anomalies in the data are appropriately documented.

☐ Other (Describe):

4.3 Reconciliation with User Requirements:

■ If data quality indicators do not meet the project's requirements as outlined in this QAPP, the data may be discarded and re-sampling or re-analysis of the subject samples may be required by the EPA site manager.

☐ Other (Describe):

Table 1: Sample Summary

Site Name: Atlantic Groundwater Site	**Location:** Atlantic, Iowa	
Tetra Tech START Site Manager: Steve Holmes	**Activity/ASR #:** To be determined	**Date:** 08/12/02

No. of Samples	Matrix	Location	Purpose	Depth or other Descriptor	Requested Analysis	Sampling Method/SOP	Analytical Method/SOP
24	Soil	Geoprobe locations in source area	To determine VOC concentrations in subsurface soils in the suspected source area	TBD	VOCs	EPA SOP 4230.7A & Method 5035	Method 5035
6	Soil	Monitoring well boring locations in or near source area	To determine VOC concentrations in subsurface soils in and near the suspected source area	TBD	VOCs	Method 5035	Method 5035
2	Soil	Duplicate samples from Geoprobe locations	QC	TBD	VOCs	EPA SOP 4230.7A & Method 5035	Method 5035
1	Soil	Duplicate sample from monitoring well boring	QC	TBD	VOCs	Method 5035	Method 5035
3	Water	Monitoring wells	To determine VOC concentrations in groundwater in and near the suspected source area	TBD	VOCs	EPA SOP 4230.15A	EPA SOP 3230.9A
1	Water	Duplicate sample from monitoring well	QC	TBD	VOCs	EPA SOP 4230.15A	EPA SOP 3230.9A
1	Water	Trip blank	QC	NA	VOCs	NA	EPA SOP 3230.9A
1	Water	Field blank	QC	NA	VOCs	NA	EPA SOP 3230.9A

Table 2: Data Quality Objective Summary

Site Name: Atlantic Groundwater Site	**Location:** Atlantic, Iowa	
Tetra Tech START Site Manager: Steve Holmes	**Activity/ASR #:** To be determined	**Date:** 8/12/02

Matrix/ Analysis	Analytical Method	Data Quality Measurements					Sample Handling Procedures	Data Management Procedures
		Accuracy	Precision	Representa-tiveness	Complete-ness	Compar-ability		
SOIL & WATER								
VOCs	see Table 1	per analytical method	per analytical method	judgmental sampling based on professional judgement	90%; no critical samples have been identified	standardized procedures for sample collection and analysis will be used	see Section 2.3 of QAPP	see Section 2.10 of QAPP

APPENDIX 1

SITE-SPECIFIC INFORMATION FOR THE ATLANTIC GROUNDWATER SITE

(Two Pages)

The City of Atlantic is located in Cass County, Iowa, approximately 75 miles west of Des Moines, Iowa, and 45 miles northeast of Council Bluffs Iowa (see Appendix 2, Figure 1). Tetrachloroethene (also called perchloroethene or PCE) was detected in Atlantic Municipal Utilities (AMU) public water supply (PWS) well #7 during a water quality survey conducted by the Iowa Department of Natural Resources (IDNR) in 1982. Subsequent sampling events through the 1980's and 1990's detected PCE in well #7 at concentrations ranging from 11 micrograms per liter (µg/L) in March 1995 to 260 µg/L in August 1984. Since August 1982, water from well #7 has been pumped to either Buttermilk Creek or to the City of Atlantic's waste water treatment system in an attempt to restrict the migration of the PCE contamination to other nearby drinking water supply wells.

In August 1987, Ecology & Environment, Inc., under contract to the U. S. Environmental Protection Agency (EPA), delineated the approximate extent of PCE contamination by conducting a soil gas survey. The survey suggested the source area was just south of 7th Street and east of Plum Street (see Appendix 2, Figure 2). The area is now occupied by a Burger King restaurant and a building occupied by Rolling Hills Bank and Trust. The report also stated that a former dry cleaning business (pre-1960) was located in the area of highest PCE concentrations detected in the soil gas samples (i.e., the suspected source area).

In 1998, IDNR conducted a follow-up investigation of the PCE contamination to better define the source. The report concluded that the primary source of PCE contamination appeared to be the location of the former dry cleaning business, now owned by the Rolling Hills Bank and Trust (see Appendix 2, Figure 2). The report also recommended that monitoring wells be installed to better define the extent of PCE contamination in groundwater near the suspected source area.

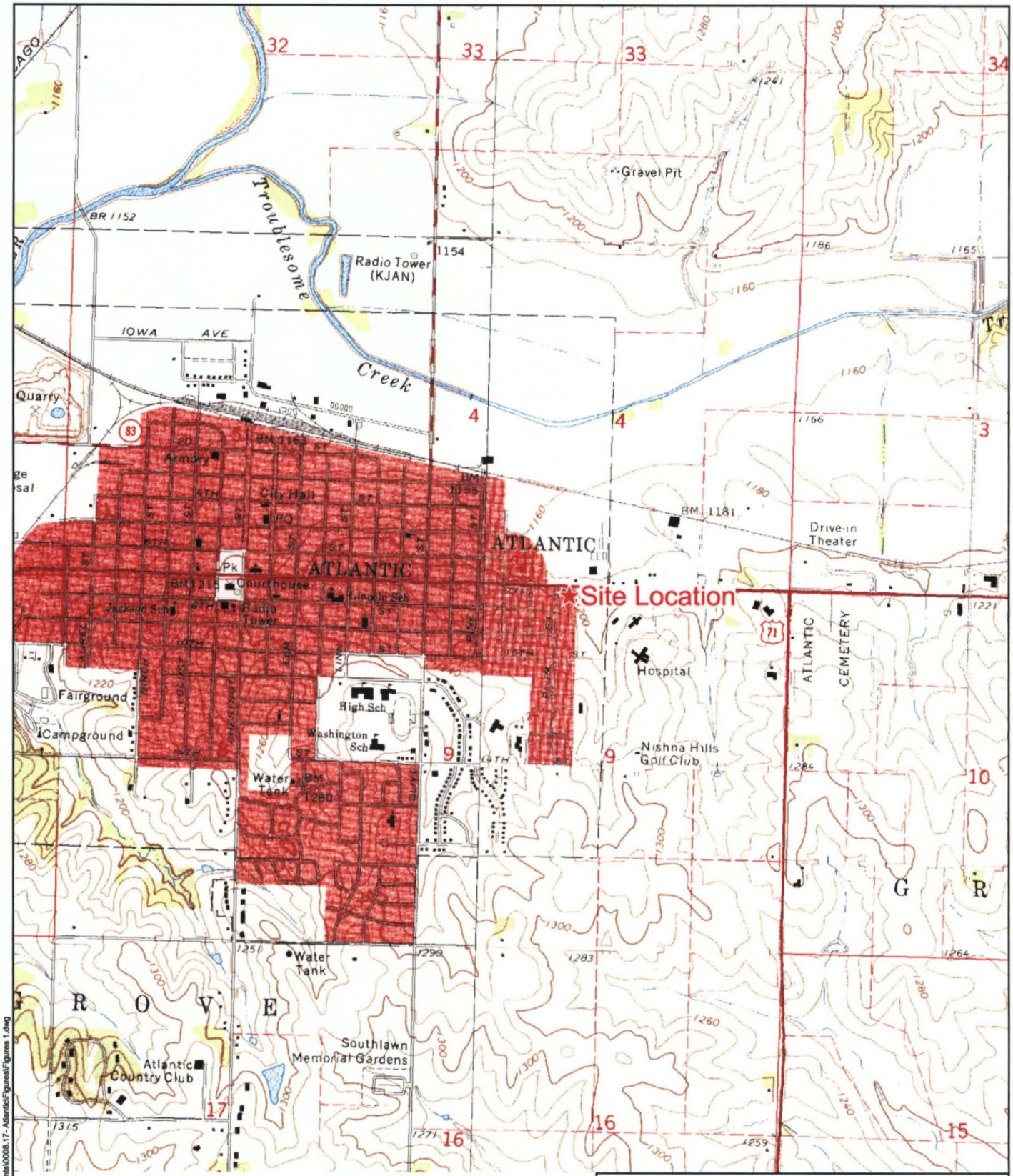
The primary goal of this removal assessment is to better define the limits of the soil contamination in the previously identified source areas and to obtain ground water quality data in the immediate vicinity of the source areas. Accordingly, three two-inch-diameter groundwater monitoring wells will be installed within the PCE plume identified by the 1987 soil gas survey and twelve Geoprobe borings will be advanced in the suspect source areas currently occupied by Burger King and the Rolling Hills Bank and Trust buildings. Figure 3 in Appendix 2 depicts the proposed monitoring well an Geoprobe boring locations. Two soil samples and one ground water sample will be collected from each monitoring well location for off-site analysis of volatile organic contaminants (VOC). Additionally, the

Geoprobe sample locations will be advanced to a depth of 35 feet or refusal which ever occurs first. Two soil samples will be selected from each of the Geoprobe boring locations for off-site analysis of VOCs. A photoionizaiton detector will be used as an aid in selecting the two soil sampling intervals at each monitoring well and Geoprobe location. In general, the sample intervals will be selected based on the highest PID readings at each location. If no elevated PID readings are observed at a sampling location, best professional judgement will be used to select two representative sampling intervals per boring location. All samples will be delivered to the Region 7 EPA Laboratory in Kansas City, Kansas.

APPENDIX 2

FIGURES

(Three Pages)



Source: USGS Atlantic, IA 7.5 Minute Topo Quad, 1971
USGS Wiota, IA 7.5 Minute Topo Quad, 1971

Atlantic Water Supply Site
Atlantic, Iowa

Figure 1
Site Location Map

Tetra Tech EM Inc.

Date: 07/16/02 | Drawn By: Roger Stull | Project No: G9011.L.01.0008.17

V:\START 2 (G9011)\Task 0008 - CERCLA Assessments\0008.17- Atlantic\Figures\Figures 1.dwg

Legend

- Municipal Well
- IDNR 1999 Hot Spot
- E&E 1987 Hot Spot

0 250 500 Feet

Source: Iowa DOQQs (1990-1994); IDNR 1999; E&E 1987.

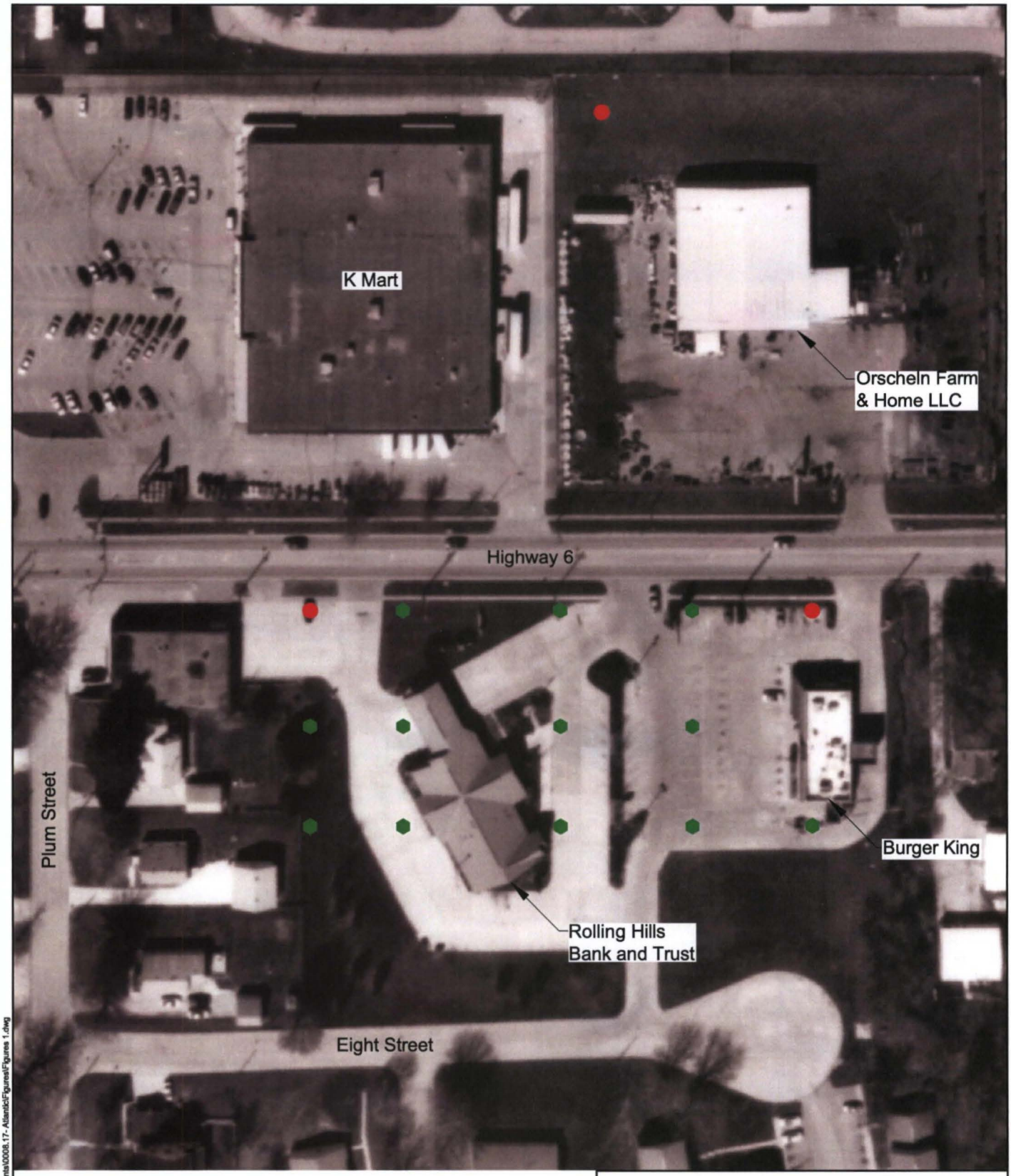
Atlantic Water Supply Site
Atlantic, Iowa

FIGURE 2
Site Layout Map

Tetra Tech EM Inc.

Date: 07/17/2002 Drawn By: S.P. Martin Project No. G9011.01.0008.04

V:\START2\Task 0008 - CERCLA Assessments\0008.17- Atlantic\Figures\ArcView\AtlanticFig2.mxd



Legend
- Proposed monitoring well location
- Proposed Geoprobe™ location

N

0 50 100
Approximate Scale in Feet

Source: Snyder and Associates, 4/4/99

Atlantic Water Supply Site
Atlantic, Iowa

Figure 3
Proposed Monitoring Well
and Geoprobe™ Locations

Tetra Tech EM Inc.

Date: 07/16/02 Drawn By: Roger Stull Project No: G9011.L.01.0008.17

V:\START 2 (G9011)\Task 0008 - CERCLA Assessments\0008.17- Atlantic\Figures\Figures 1.dwg